

REMARKS

Claims 1-30 currently appear in this application. The Office Action of December 31, 2007, has been carefully studied. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicant respectfully requests favorable reconsideration, entry of the present amendment, and formal allowance of the claims.

The Claimed invention

The invention claimed herein relates to coalesced wax particles on a surface. The coalesced wax particles are produced by initially suspending the particles in a liquid in which the boiling point of the liquid phase is lower than the melting point of the wax(es) suspended therein. This suspension is applied to a surface, the solvent is evaporated and the wax particles are heated to cause the particles to coalesce. What is also claimed is a method for coating a surface using these steps. The coating on the surfaces makes it easy to clean graffiti from the surfaces.

Amendments

Claim 1 has been amended so that the claim is directed to coalesced wax particles. This claim is now in the form of a product-by-process claim. Support for this

amendment can be found in the specification in paragraph 0160-0164.

Claim 1 has been further amended by enumerating the types of waxes to make it clear that polyethylene wax, polypropylene wax, oxidized polyethylene wax, and oxidized polypropylene wax are the waxes contemplated.

Claim 1 has been amended to explicitly state that the boiling point or boiling point range of the liquid phase must be lower than the melting point or melting point range of the polyolefin wax or the mixture of polyolefin waxes. Support for this amendment can be found in the specification as filed at paragraph 0179.

In order to conform to the language of claim 1, claims 2-9 are now directed to coalesced wax particles on a surface.

Claim 2 has been reworded to remove ambiguity regarding the composition of the liquid phase. The liquid phase as now recited in claim 2 comprises alcohol and water.

Claims 3, 6, and 7 have been amended to delete the ranges noted and "preferably" and "in particular" to remove ambiguity.

Claim 4 has been made to depend from claim 3. Basis for this amendment can be found in paragraphs 0096 and 0097. Paragraph 0096 describes the amounts of wax and liquid phase

used to provide a coating as claimed herein, and this paragraph corresponds to the subject matter of claim 3. The composition used to produce the coating is further specified in paragraph 0097, specifying the auxiliary agents identified in claim 4.

Claim 8 has been amended to add 'the" to make the text more clear. This amendment does not limit the scope of claim 8.

Claim 9 has been amended to depend from claim 1. Claim 9 now recites that one wax used in the coating is polypropylene. This is mentioned in the specification as filed at paragraph 0013, describing one embodiment of the invention, which makes it clear that claim 9 should depend from claim 1.

Claim 10 has been amended in a similar fashion to claim 1 so as better to define the waxes. Claim 10 has also been limited by explicitly stating that the boiling point or boiling point range of the liquid phase must be lower than the melting point or melting point range of the polyolefin wax or mixture of polyolefin waxes. Support for this amendment can be found in the specification as filed at paragraph 0179.

Claims 14, 19 and 20 have been amended to change "obtainable" to -obtained--. This amendment removes ambiguity in these claims.

Claims 15 and 21 have been amended to depend from claim 10.

Claim 23 has been amended to depend from claim 15.

Claims 26 and 27 have been reworded to delete the reference to "said method of coating" to clarify the meaning of the claims. These claims now specify that the coating composition is applied to the topmost side of the film.

Specification

The missing serial numbers correspond to priority applications for the present application. These numbers should be Danish patent application DK PA 20903 00654 and DK PA 2003 00655.

Claim Objections

Claims 4 and 9 are objected to because they are said not be not dependent upon another claim nor are they independent claims.

The present amendment makes claim 4 depend from claim 3 and claim 9 depend from claim 1. It is respectfully requested that claims 4 and 9 be considered on the merits.

Rejections under 35 U.S.C. 112

Claims 1-3, 5-8 and 10-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing

to particularly point out and distinctly claim the subject matter that applicant regards as the invention.

This rejection is respectfully traversed.

Claims 1, 10, 15, 21 and 23 have been amended to recite oxidized polyethylene waxes and oxidized polypropylene waxes.

Claim 1 has been amended to recite a composition.

In claims 2, 3, 6 and 7, "preferably" and "in particular" have been deleted.

Claim 3 has been amended to delete "any of."

With respect to "high density polyethylene was," this is a well known term of the art as evidenced by the following articles submitted herewith:

Wikipedia definition of High-Density Polyethylene

ChemIndustry.com listing of high density polyethylene wax

Chemcor.net identification of properties of high density polyethylene emulsions.

Claims 14, 19 and 20 have been amended to delete "obtainable" and replace it with -obtained--.

Claims 26 and 27 have been amended to delete "said method of coating."

Claim 2 has been amended so that there is no need for Markush terminology.

Claim 1 has been reworded to claim a coating, in the form of a product-by-process claim, and claims 2-9 are all directly or indirectly dependent upon claim 1. The remaining claims have been reworded to more clearly define the claimed subject matter as outlined below. In addition, some formerly independent claims have been made dependent on previous claims. Thus, claims 15 and 21 have been changed from independent claims to depending from claim 10, and claim 23 now depends from claim 15. These amendments have all been made to define the claimed invention more clearly, and no restriction of the scope of the claims is intended.

The Examiner has objected to the use of the word "components" in several of the claims. It is respectfully submitted that there is no need for an antecedent basis for "components" in claim 1 as amended. Claim 1 has been amended to recite "a mixture of components comprising polyolefin waxes suspended in a liquid phase..." It is clear that the components are polyolefin waxes suspended in a liquid phase, and no antecedent basis is required for this. All of the claims recite that a mixture of waxes can be used in the coating composition, and it is well known that a mixture is made up of "components." With no further limitation on the word, it is clear that components can only refer to the individual

compounds that make up the mixture, specifically, to the listed group of waxes.

With respect to "the particles of polyolefin wax" must be suspended in a liquid phase, or if only the mixture must be suspended, the claims have been amended as noted above. Of course, a suspension must contain particles in order to be meaningfully described as a suspension, and therefore the term "particles" must refer to both the polyolefin wax or to the mixture of polyolefin waxes, i.e., the mixture of polyolefin waxes must necessarily be in some particulate form to be suspended. It is further expressed that the liquid phase is evaporated, which emphasizes that the composition comprises a suspension of particles from which a liquid phase can be evaporated.

In order to make clear that both the polyethylene wax and the polypropylene wax can be oxidized, the claims have been amended to recite oxidized polyethylene wax and oxidized polypropylene wax. Support for this amendment can be found in the specification as filed at paragraph 0071, from which it is evident that both of the polyethylene and polypropylene waxes may be used in oxidized form.

The Examiner has asserted that several of the claims are not clear as to whether both of the polyethylene and polypropylene waxes are required. The meaning should be clear

from a reading of claim 1 as amended: "waxes are selected from the group consisting of polyethylene waxes, polypropylene waxes, oxidized polyethylene waxes and oxidized polypropylene waxes." It is clear from this recitation that both waxes are not required, but there is nothing to limit the selection to one of the recited waxes.

Claim 8 as amended specifies that in one embodiment the polyethylene wax is a high density polyethylene, which is said to be unclear. Paragraph 0117 of the specification defines this term. A great many examples of waxes that can be used, particularly from pages 20-29. Furthermore, the term HDPE, high density polyethylene, has become standard in the art. *Handbook of Polyethylene*, Peacock, Marcel Dekker Inc., 2000, mentioned in paragraph 0120 of the present specification, as well as other locations in the application, provides ample description and definition of the traditional meaning of "high density polyethylene" as used within the field. One skilled in the art would therefore readily know what is a "high density polyethylene."

Art Rejections

Claims 1, 2, 5, 6, 10, 11, 13-16, 18-21, 23, 24, 28 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Perlman et al., U.S. 6,033,736.

This rejection is respectfully traversed. As noted above, what is claimed herein relates to forming a coating of coalesced wax particles on a surface by suspending wax particles in a liquid that has a boiling point lower than the melting point of the wax, applying the suspension to a surface to be coated, evaporating the solvent, and then heating the wax particles to cause them to coalesce. Perlman, on the other hand, discloses a method for improving paint adhesion to a surface by applying a polyolefin wax suspension containing water and an emulsifier to a surface prior to applying paint. Perlman use an aqueous wax emulsion. In a comparative example described at column 8, lines 1-36, Perlman applies the wax suspension to a microscope slide and dries the suspension before melting and resolidifying the wax. The wax used by Perlman has a melting point between 50°C and 100°C (claim 1). Since this wax is suspended in water, which has a boiling point of 100°C, the melting point of the wax is significantly lower than the boiling point of the liquid phase. Thus, Perlman differs from the presently claimed method and coating in at least two aspects: the relation between the melting point of the wax and the boiling point of the liquid phase, and the compulsory presence of an emulsifier in the suspension. Moreover, the coating as claimed herein is designed to make it easy to remove graffiti from a surface to

which this coating has been applied. The Perlman coating is said to make it easier to adhere paint to a surface. These two objects are diametrically opposed, as one would not want graffiti in the form of paint to adhere strongly to a surface. Thus, it is respectfully submitted that the Perlman coating is not at all the same as the coating claimed herein.

Claims 1, 2, 5, 8, 10, 11, 13-16, 18-21, 2, 3, 28 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Kubo et al., 4,499,225.

This rejection is respectfully traversed Kubo describes a coating composition comprising polyethylene and/or polypropylene, and an oxidized polyethylene with an object or producing coatings having good chemical resistance. Neither the particle sizes, the general nature of the polymers nor the solids content of the Kubo suspension are the same as claimed herein. The major component of the Kubo suspension is a polyethylene or polypropylene component, which is only specified as being high density, medium density or low density polyethylene. The present claims require that the polyethylene be high density polyethylene. Furthermore, no details are provided regarding the melting point or other characteristics of this component. In the Test Examples shown in columns 4 and 5, the suspensions are applied to substrate surfaces, and the coated surfaces are baked in a single

heating step at a temperature sufficiently high both to evaporate the solvent and melt the polymer (200 or 180°C for 10 minutes). The coatings obtained are from 200-350 microns thick. Thus there is nothing in Kubo regarding using a solvent having a boiling point lower than the melting point of the wax, as this relationship is clearly immaterial in Kubo, where the liquid is evaporated at the same time the wax is melted. The presently claimed method requires that the liquid first be evaporated, and then the wax melted. In the herein claimed process, the liquid is evaporated at a temperature lower than the melting point of the wax particles so that the wax particles retain their shape during the evaporation step. The particle size of the wax is relatively small such that substantially the entire particle solvents upon heat treatment, making it possible of the particles to coalesce with other particles (page 31, lines 10-30).

The presently claimed method and coating differ from Kubo in that the melting point of the wax must specifically be higher than the boiling point of the liquid phase, and that the liquid must be evaporated prior to melting/coalescing the wax particles.

The technical differences between the presently claimed process and coating material and the teachings of Perlman and Kubo have been discussed *supra*. In the presently

claimed method, the wax coating is produced by first evaporating the liquid, and then coalescing the wax. Neither Perlman nor Kubo applies the coating in this method.

In the case of Perlman, residual solvent (water) may have a negative impact on the coating, as the wax melts at a lower temperature than the boiling point of the dispersing liquid. Likewise, Kubo does not include a step to specifically evaporate the liquid prior to melting the wax. The fact that the polymer may melt before the liquid is fully evaporated may have a deleterious impact on the coating so obtained.

Perlman's object is to produce a primer yielding improved adherence of paint subsequently applied to a surface treated with a wax emulsion. The object of Kubo is to provide a coating composition for use in coating providing *inter alia* good chemical resistance.

Claims 3, 7, 12, 17, 22, 25-27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Perlman.

Claims 3, 6, 7, 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kubo.

These rejections are respectfully traversed. The wax coating prepared by melting and resolidifying the wax emulsion of Perlman was only analyzed microscopically, and no experiments were conducted to test the adherence of paint to

this coating, nor its chemical resistance. It is speculated that paint adheres well to a wax coating prepared according to Perlman's method (i.e. without melting and resolidifying the wax) because of the microstructure afforded by the intact wax particles (column 8, lines 11-28). The fact that the melted and resolidified wax coating was morphologically different from a coating prepared from intact wax particles does not give an indication that this coating will solve the technical problem to be solved by the presently claimed method, namely, to protect surfaces from graffiti and the effects of pollution. There are numerous examples in the present application of the ease with which graffiti can be removed from surfaces that have been treated with the coating composition and method claimed herein. However, since Perlman is concerned with adherence of paint to a coated surface, it is respectfully submitted that Perlman teaches away from the herein claimed invention.

Kubo provides no details regarding the melting point or other thermal characteristics of the polyolefin components. In the Test Examples, no exact details are given on the actual events occurring during the baking of the coating. In Comparative Example 1, a coating composition without the oxidized polyethylene component is prepared and applied to a substrate before baking, as done in the Test Examples.

However, this process fails to produce a coating of the substrate (column 5, lines 31-34), and it is speculated at column 5, line 39, that the cause may be that the "water vaporized out of the material." This observation indicates that evaporation of the suspending solvent causes a problem in the coating process, and therefore, Kubo also teaches away from the presently claimed method and coating. Thus, the coalesced wax particles on a surface as claimed herein cannot be inferred from reading Kubo.

It is respectfully submitted that one skilled in the art, reading Perlman, who discloses a method of adhering paint to a surface, would not be led to use this process for making it easy to remove graffiti from a surface, since much graffiti is spray painted onto a surface. Kubo adds nothing to Perlman, because Kubo also teaches away from the presently claimed method.

From Kubo, one skilled in the art will know that polyolefin coatings may be used to prepare protective coatings, and that a solidifying wax emulsion as disclosed by Perlman could be tested for such characteristics. However, it is clear that such a coating is not similar to that claimed herein, since the Kubo and Perlman wax has a lower melting point than liquid, and there is a risk that traces of

water or other liquid may be left in the re-solidified coating.

Alternatively, one skilled in the art may want to test prior evaporation of the liquid from the Kubo suspension before melting and resolidifying the dried polyolefin. However, from Kubo, the skilled person will already know that evaporating the solvent may cause the problems discussed above, and this will also lead to a recognition of potential problems caused by the Perlman method. In Perlman, the coating composition was applied to a microscope slide (column 8, lines 14-17), and there was no disclosure of the coating method. Conventionally, liquids or suspensions are applied to microscope slides by pipetting. However, at the scale of the examples in Kubo (Test Examples 1-3) and as claimed herein, pipetting is highly unsuitable, so the suspension are sprayed onto the substrates. A microscope slide is easily handled, and it may be possible that Perlman had little trouble in keeping the slide free from vitiation and possibly in a substantially horizontal position while applying the coating composition, drying the slide, and during the heating step, thereby preventing the negative effects observed by Kubo in Comparative Example 1. There is nothing that would lead one skilled in the art to assume that the coating methods of Perlman for coating a microscope slide could be transferred to

the scale of operation of Kubo while still obtaining a comparable outcome of the process.

It is respectfully submitted that one skilled in the art reading Perlman and Kubo would not be led to a coating method in which a suspension of wax particles is applied, the liquid in the suspension is evaporated and then the coating is heated to coalesce the wax particles, wherein the melting point of the wax particles is higher than the boiling point of the liquid. Since the coating as claimed herein protects surfaces from graffiti, and the Perlman coating method makes paint adhere better to a surface, one reading Perlman, either alone or in combination with Kubo, would not be led to the herein claimed method and coating composition.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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